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ANALYZING THE TISSUE EXPRESSION PATTERNS OF DIFFERENTIALLY REGULATED GENES IN *C. ELEGANS* EXPRESSING TDP-43

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Amyotrophic lateral sclerosis (ALS) is a fatal neurodegenerative disease that affects nerve cells in the brain and spinal cord, causing loss of muscle control. The TAR DNA binding protein, TDP-43, has been shown to aggregate in the cytoplasm of diseased motor neurons. In healthy cells, TDP-43 plays a role in RNA splicing, RNA transport, and transcription. To better understand the impact of TDP-43 on neuronal health, we expressed human TDP-43 in the nervous system of the nematode *C. elegans. C. elegans* have a simple nervous system consisting of 302 neurons along with well-established behavioral assays to monitor neuronal function, making it an excellent model organism for our studies. Our goal was to identify neuronal pathways that are altered in TDP-43 expressing animals. To do this, we generated a dataset of sequenced mRNA fragments to identify genes that were differentially expressed in transgenic animals compared to wild type controls. Using wormbase.org, we curated the tissue expression pattern of these genes and determined that 54% of the 284 differentially expressed genes are expressed in *C. elegans* neurons. These findings demonstrate significant changes in neuronal gene expression in TDP-43 animals. We hypothesized that these changes are responsible for the defective mechanosensory and chemosensory responses in our TDP-43 transgenic animals. Future experiments will examine the impact of these gene products on neuronal functionality, providing insight into the cellular failures leading to neurodegenerative diseases.